

Solving Systems of Equations

Elimination Method aka Linear Combination Method (aka Multiplication - Addition Algorithm)

Steps:

1. Arrange the equations with like terms in columns.
2. If necessary, make either the x or y terms opposite by multiplying each term (in one or both equations) by the appropriate number.
*You are trying to create opposites.
3. Add the equations and solve.
4. Substitute the value found in Step 3 into either original equation to find the other value.
5. Check your answer.

Solve each system using the elimination method.

1)
$$\begin{array}{l} x - y = 3 \\ x + y = 7 \end{array}$$

2)
$$\begin{array}{l} a - b = 2 \\ a + b = 2 \end{array}$$

3)
$$\begin{array}{l} m - 2n = 8 \\ m + 2n = -8 \end{array}$$

4)
$$\begin{array}{l} -5 = x - y \\ 1 = x + 2y \end{array}$$

5)
$$\begin{array}{l} a - 2b = 0 \\ a + 2b = 12 \end{array}$$

6)
$$\begin{array}{l} 3x + y = 8 \\ 3x - 2y = 2 \end{array}$$

7)
$$\begin{array}{l} 3u - 1/2v = 7 \\ 2u - 1/2v = 4 \end{array}$$

8)
$$\begin{array}{l} 1 = -2m + n \\ 1 = 2m - 3n \end{array}$$

9)
$$\begin{array}{l} 3x = 2y - 2 \\ y - 3x = 0 \end{array}$$

$$\begin{aligned} 10) \quad & 10y = 15x + 17 \\ & 15x - 10y = 50 \end{aligned}$$

$$\begin{aligned} 11) \quad & 4x + y = 4 \\ & -4(x - 1) = y \end{aligned}$$

$$\begin{aligned} 12) \quad & 2p - 3q = 5 \\ & 8 = 3p - 3q \end{aligned}$$

$$\begin{aligned} 13) \quad & -10 = m - 3n \\ & m + 2n = 20 \end{aligned}$$

$$\begin{aligned} 14) \quad & 2y + x = -7 \\ & 3 = x - 3y \end{aligned}$$

$$\begin{aligned} 15) \quad & 3c = 3d + 9 \\ & 2c + 3d = 1 \end{aligned}$$

$$\begin{aligned} 16) \quad & 2(x - y) = 14 \\ & x + 2y = -2 \end{aligned}$$

$$\begin{aligned} 17) \quad & 3(r - 2s) = 6 \\ & r + 6s = 2 \end{aligned}$$

$$\begin{aligned} 18) \quad & 3(p - 2q) = 6 \\ & 2(p + 3q) = -6 \end{aligned}$$

$$\begin{aligned} 19) \quad & \frac{1}{2}(a + b) = -1 \\ & a - b = 4 \end{aligned}$$

$$\begin{aligned} 20) \quad & 2x + 3y = 2 \\ & \frac{1}{3}(2x - y) = -2 \end{aligned}$$

$$\begin{aligned} 21) \quad & \frac{1}{3}(x + 9y) = -4 \\ & x - 3y = 0 \end{aligned}$$

$$\begin{aligned} 22) \quad & 3a - b = 2a - 5 \\ & 3b - a = 5 \end{aligned}$$

$$\begin{aligned} 23) \quad & 2(r - s) = 3 + r \\ & r = 3s + 4 \end{aligned}$$

$$\begin{aligned} 24) \quad & 3t - 4z = -6 \\ & 3t - 2z = 0 \end{aligned}$$

$$\begin{aligned} 25) \quad & -4x + 5y = -36 \\ & 5x - 3y = 32 \end{aligned}$$

$$\begin{aligned} 26) \quad & 4x + 2y = 10 \\ & y = -2x - 10 \end{aligned}$$

$$\begin{aligned} 27) \quad & 6x + 4y = 34 \\ & 9 - 2y = x \end{aligned}$$